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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/874,420	06/05/2001	Michael Arnold Joffe	US010279	5691

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EXAMINER
YAM, STEPHEN K

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/874,420	Applicant(s) JOFFE, MICHAEL ARNOLD	
	Examiner Stephen Yam	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2002*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

9/27/02

DETAILED ACTION

This action is in response to Amendments and remarks filed on August 6, 2002. Claims 1, 2, 4-11, and 13-16 are currently pending.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1, it is unclear whether "an image of said light beam received by said workpiece" is the same image as "the image of said light beam shifted on the surface of said workpiece". Therefore, it is indefinite as to whether two images of the workpiece are obtained, or whether one image is detected by the detector showing the light beam received by and also shifted on the surface of the workpiece.

In Claim 1, line 4, "said light transmitter" lacks proper antecedent basis.

Claims 2-6 are indefinite by virtue of their dependency on an indefinite claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 10, and 11 are rejected under 35 U.S.C. 102(b) as being unpatentable by Kuniyoshi et al. US Patent No. 4,614,432.

Regarding Claim 1, Kuniyoshi et al. teach (see Fig. 5) a positioning system comprising a workpiece (4), a light source (10) (see Col. 4, lines 9-10) for directing a light beam onto the top surface of the workpiece, and a detector (9) coupled to the light transmitter for detecting an image of the light beam received by the workpiece and for processing (see Col. 6, lines 6-7) a deviation direction and a deviation amount based on the image of the light beam shifted (see Col. 6, lines 24-25) on the surface of the workpiece.

Regarding Claim 2, Kuniyoshi teach (see Fig. 5) a holding means (12, 13, 14) adapted to releasably hold the workpiece and for vertically adjusting (see Col. 5, lines 15-17) the position of the workpiece based on the deviation direction and the deviation amount.

Regarding Claim 4, Kuniyoshi teach (see Fig. 5) the detector located above a normal axis associated with the workpiece.

Regarding Claim 10, Kuniyoshi et al. teach a positioning system for use in adjusting the position of a workpiece (4) comprising (see Fig. 5) a light generating means (10) for projecting a light beam onto the top surface of the workpiece at a predetermined angle, a video capturing means (9) for detecting the light beam received on the workpiece and for converting the detected light beam into electrical signals (see Col. 3, line 53-56), and a computer means (see Col. 1, line 46) for processing a deviation direction and a deviation amount based on the detected light beam shifted on the surface of the workpiece.

Regarding Claim 11, Kuniyoshi et al. teach (see Fig. 5) a means (12, 13, 14) for releasably holding the workpiece in a substantially horizontal orientation and moving the workpiece in the X-Y plane to a preselected position (see Col. 4, lines 65 to Col. 5, line 1).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5, 7, 8, 9, 13, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuniyoshi et al.

Regarding Claims 5 and 14, Kuniyoshi et al. teach a positioning system as taught in the respective parent claims. Kuniyoshi et al. do not teach the light generating means comprising a laser diode. It is well known in the art to use a laser diode as a light source to provide high-intensity, concentrated light energy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a laser diode as the light generating means in the positioning system of Kuniyoshi et al., to enhance the accuracy and contrast of image detection from a higher-power light source.

Regarding Claims 7 and 8, Kuniyoshi et al. teach a method of adjusting the vertical position of a workpiece (4), comprising (see Fig. 5) transmitting a light beam (from 10) onto the top surface of the workpiece at a specific angle, detecting (9) the light beam projected on the top surface of the workpiece, and detecting a lateral shift of the detecting light beam on the top

surface of the workpiece. Kuniyoshi et al. also teach the focusing of the optical system through vertical movement (see Col. 5, lines 15-18). Kuniyoshi et al. does not teach converting the detected lateral shift to a corresponding vertical distance using trigonometry, or positioning the workpiece based on the converted vertical distance. It would have been obvious to one of ordinary skill in the art at the time the invention was made to convert the lateral shift to a vertical distance using well-known trigonometry principles and position the workpiece based on the converted vertical distance in the method of Kuniyoshi et al., to determine the proper focal length of the optical system and adjust the distance between the optical system and the workpiece to correctly maximize the intensity of light on the workpiece.

Regarding Claim 9, Kuniyoshi et al. teach a positioning system as taught in Claim 7. Kuniyoshi et al. do not teach the determination of a center point using boundary signals. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kuniyoshi et al. with a center-point determination method using the boundaries of the detected image, as it is common knowledge to process a designated reference point based on the edges of a surface, allowing for a comparison of a detected image with a reference image through alignment of the center point.

Regarding Claim 13, Kuniyoshi et al. teach a positioning system with a light generating means, video capturing means, and computer means for processing a deviation direction and amount based on a detected light beam. Kuniyoshi et al. also teach the attachment of the CPU to the light detector and the X, Y, and Z movement (see Col. 4, lines 65 to Col. 5, line 1) of the workpiece. Kuniyoshi et al. do not teach the computer means determining a lateral shift direction and an amount of lateral displacement of the projected light beam within the surface of

the workpiece. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the computer mans to determine the lateral shift direction and amount of lateral displacement in the system of Kuniyoshi et al. using well known principles, to provide accurate displacement data to the X, Y, and Z moving means for correctly positioning the workpiece.

Regarding Claim 16, Kuniyoshi et al. teach a positioning system detecting a deviation upon a workpiece with a reference image. Kuniyoshi et al. do not teach the use of a first and second light beam to provide an indication of distance. However, it is common knowledge to use a plurality of light beams to further increase the accuracy of surface-sensing devices. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kuniyoshi et al. with two light beams, as that would allow for the use of triangulation in determining a position offset, and provide depth perception for vertical adjustment of the workpiece.

5. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuniyoshi et al. in view of Yoshii et al. US Patent No. 5,969,820.

Kuniyoshi et al. teach a positioning system detecting a deviation upon a workpiece with a reference image. Kuniyoshi et al. do not teach the detector comprising a photodiode camera. Yoshii et al. teach a positioning system with a detector comprising a CCD (charged-coupled device) in Column 5, lines 34-36, a form of photodiode camera. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of

Kuniyoshi et al. with the CCD photodiode camera of Yoshii et al., to provide a simple and inexpensive photoelectric element of detection that is well known in the art.

Response to Arguments

6. Applicant's arguments filed August 6, 2002 have been fully considered but they are not persuasive.

Examiner interprets Claim 1 as a system containing a light source, detector, and workpiece, wherein the detector detects a single image containing a light beam received off the workpiece which is shifted from an optimal beam location, and processes a direction and amount of deviation to align the workpiece to an optimal location based on the shift on the detected image between the actual beam and the optimal beam.

Applicant argues with respect to Kuniyoshi et al. that Kuniyoshi et al. do not teach features including processing a deviation direction and a deviation amount based on the image of the image of the light beam shifted on the surface of the workpiece. Examiner maintains that Kuniyoshi et al. teaches detecting a position of a positioning pattern (see Col. 6, lines 24-25) and correcting the position for alignment (see Col. 6, lines 35-37) through movement of the wafer (see Col. 6, lines 39-41), thereby realizing the direction and distance to deviate the wafer in order to move it to its correct position. Also, since Kuniyoshi et al. teaches a photomultiplier to detect the image, a two-dimensional image is captured and hence, a shift in the captured image is always in a lateral direction with respect to the plane of the wafer.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (703)308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY S.Y.
September 24, 2002

DAVID PORTA
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